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NAVY AV-8B
CRASH SURVIVABLE FLIGHT
INCIDENT RECORDER (CSFIR)

MEETING MINUTES OF THE
PROGRAM REVIEW
28 April, 1999

CONTRACT GS-24F-3027G
DELIVERY ORDER N00019-98-F-0016
DATA ITEM A002
3 May, 1999

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On 28 April 1999, representatives from the Navy, Boeing and Smiths Industries (SI) met at the Naval Air Weapons Development Center, Building P302, China Lake, CA for a Program Review / Technical Interchange Meeting in support of the AV-8B Crash Survivable Flight Incident Recorder System (CSFIR) integration program. Smiths Industries is developing software for its Voice and Data Recorder (VADR®) under this contract. A list of attendees is in attachment #1. Attachment #2 lists the resulting action items.

The objective of this meeting was to provide an update on this program including the Program Status, Schedule, Interface Control Document Status, Software Design Changes, and System Test Status. A copy of the presentation material is shown in attachment #3. Additionally, there was a demonstration of the Smiths VADR® in the AV-8B simulation laboratory. This demonstration involved recording both voice and data. This recording was followed by downloading, processing and playback using the Dolch computer provided by DuoTech.

1. China Lake plans to do a formal verification test of the AV-8B VADR software in their lab after our final software release. No flight testing for the AV-8B CSFIR is currently budgeted. Successful completion of the laboratory testing will constitute final Navy approval of the software.
2. Boeing is funded to build three AV-8B Val/Ver Kits. These kits will be supplied to China Lake where they will be shelved until future funding (currently uncommitted) is received. The Val/Ver kits are currently scheduled for delivery by Boeing in July 2000.
3. The team agreed that an AV-8B CSFIR flight test would be worthwhile for the program. China Lake accepted an action item (AI #1) to produce a ROM estimate for conducting a flight test after formal verification lab testing in China Lake is completed. Boeing also accepted an action item to determine if they will have any unallocated money remaining from their ECP effort which could be diverted to a similar type flight test at Boeing. (AI #2)
4. Boeing accepted an action item to supply AV-8B 'A' Kit drawings to the Navy (China Lake) so the Navy can estimate the tasks necessary to conduct a flight test. (AI #3)
5. Boeing is under contract to produce preliminary AV-8B CSFIR technical publications which will list O-Level maintenance procedures.
6. A total of three Dolch portable computers were bought by the Navy. Duotech / Smiths integrated SI's AV-8B CP software (35351-552663-01-01), AV-8B MP Software (35351-552664-01-01), AV-8B ASCDB (35351-552665-01-01), PC DECOMP (35351-549333-14-01, 35351-549342-14-01), DFIR2DDF(35351-552754-EX-02), WinDRT (35351-549651-EX-05), WinVoice, VOGP software plus SI's ISA download card. One computer was demonstrated and delivered to AV-8B China

Lake at this meeting. China Lake requested that the latest manuals be supplied (AI #6).

ATTACHMENT #1
Attendance List
AV-8B Program Review
28 April, 1999

Beitnes, Brian	NAWCWD Lab Man	760-939-5199	brian.beitnes@chinalake.navy.mil
Bock, Wolf	EMA (support to PMA-209)	301-863-8988 x390	wolf_bock@emainc.com
Brewer, Gene	NAWCWD China Lake (AV-8B)	760-939-5884	gene.brewer@chinalake.navy.mil
Campbell, Paul	Boeing (support to PMA-257)	301-866-0500	campbell@sfpsi.com
Conquest, Tom	Smiths Industries	616-241-7900	conquest_tom@si.com
Kimmey, Mark	Logicon (support to PMA-209FB)	301-757-0891	kimmeymc@navair.navy.mil
Maxwell, James	NAWCD - MLVS	760-939-5918	maxwellj@av8bmx.chinalake.navy.mil
Otten, Bill	Smiths Industries	616-241-8928	otten_william@si.com
Page, Ronald	NAWCWD System Test	760-939-9984	pagre@navair.navy.mil
Parillo, Bill	PMA-209/AIR-4.5.3.2	301-757-6474	parillowa@navair.navy.mil
Rogers, Dan	Duotech Services	828-369-5411	duotech@dnet.net
Smith, Leo	Boeing	314-233-2079	leo.w.smith@boeing.com
VanDorp, Jeff	Smiths Industries	616-241-7213	vandorp_jeff@si.com
Vermeulen, Ted	Smiths Industries	616-241-8264	vermeulen_ted@si.com
Wilcox, Donna	EMA (support to PMA-209F)	301-863-8988 x371	donna_wilcox@emainc.com
Zavich, Walt	Boeing St. Louis AV-8B Team	314-234-2203	vlado.zavich@boeing.com

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ATTACHMENT #2
Action Items
AV-8B Program Review
28 April, 1999

Number	Action Item	Assigned To	Originator	Due Date
1	Provide a ROM for the 'orange wire' installation of a CSFIR, based on preliminary Boeing drawings.	Gene Brewer	PMA-209	6/1/99
2	Provide a ROM for the 'orange wire' installation of a CSFIR, based on preliminary Boeing drawings, into Boeing a/c B2 or T1. Investigate funding with left over funds from canceled production effort.	Boeing	PMA-209	6/1/99
3	Provide preliminary install drawings to China Lake and PMA-209	Boeing	China Lake	5/12/99
4	Establish telecon to clarify bit ambiguity requirements.	PMA-209	SI	5/5/99
5	Provide PMA-209 with address of library to ship SW and data items.	China Lake	PMA-209	5/5/99
6	Ship ground software manuals to China Lake Library	DuoTech	China Lake	5/5/99

U. S. Navy AV-8B CSFIR Program Review

April 28, 1999

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Agenda

- Program Overview
  - Task Description
  - Deliverables
  - Schedule
  - Accomplishments to Date
  - EMI Test Results
- Software Status
- ICD / SRS Review
- Test Support Equipment (DuoTech)

Agenda (cont.)

- Software Laboratory Demonstration
- System / Software Test Status
- Planned Activities For Next Two Months
- Action Items (old)
- Action Items (new)
- Issues / concerns

USN CSFIR AV-8B Program Overview

- Develop Flight Software for US Navy AV-8B aircraft
- Recurring VADR hardware not included in the contract
- Specific aircraft variations in this effort are:
  - AV-8B Day/ Night Attack
  - TAV-8B (Trainers)
  - AV-8B Radar
- Single Flight Software will work for all AV-8B variations above

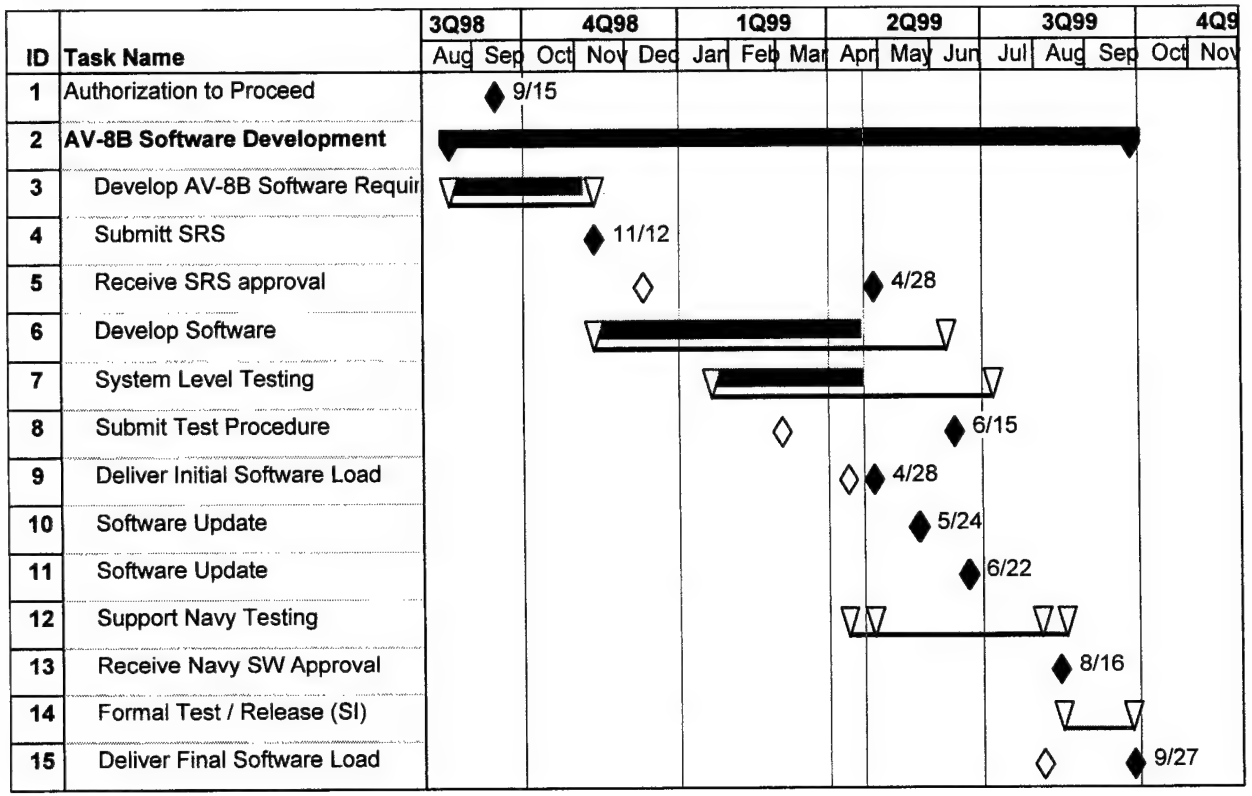
Task Description (AV-8B)

- Develop System / Software Requirement Specification for Flight Software
- Develop VADR® Flight Software configured for AV-8B
- Test final software (Government invited to witness)
- Support Navy AV-8B integration efforts

Deliverables

- AV-8B Flight Software (A004)
- Data Items
  - Meeting Agenda (A001)
  - Meeting Minutes (A002)
  - Software Requirement Specification - Flight Software (A003)
  - SI Test Plan (A006)

Schedule


3Q98
4Q98
1Q99
2Q99
3Q99
4Q9
Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
ID
Task Name
1 Authorization to Proceed
2 AV-8B Software Development
3 Develop AV-8B Software Requir
4 Submitt SRS
5 Receive SRS approval
6 Develop Software
7 System Level Testing
8 Submit Test Procedure
9 Deliver Initial Software Load
10 Software Update
11 Software Update
12 Support Navy Testing
13 Receive Navy SW Approval
14 Formal Test / Release (SI)
15 Deliver Final Software Load
9/15
11/12
4/28
4/28
6/15
4/28
5/24
6/22
8/16
9/27

Accomplishments To Date

- Contract Signed (15-Sep-98)
- SRS submitted
- SI Software Test Environment established
- Initial Software delivered

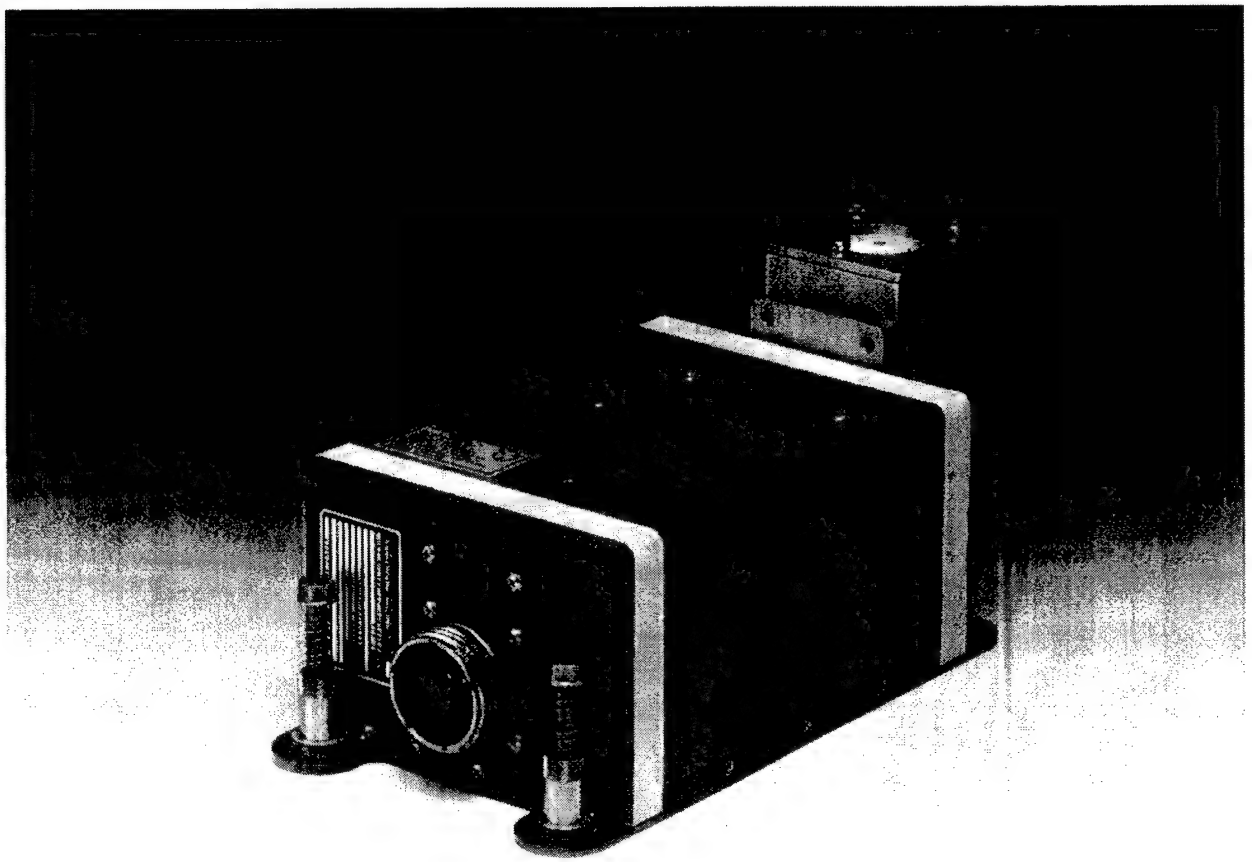
EMI Testing

- SI contracted to "conduct limited RE02 testing to help identify the differences and the associated cause between the results obtained by the Navy and SI."
- Status: Testing Complete, test report being finalized at SI.

EMI Testing

- A series of 20 different individual tests were run.
- No test implementation errors were revealed which would explain the differences between the original SI and Navy results.
- However, it is felt a combination of test set up factors contributed to the original Navy outages.
- The VADR® has demonstrated satisfactory EMI RE02 performance.

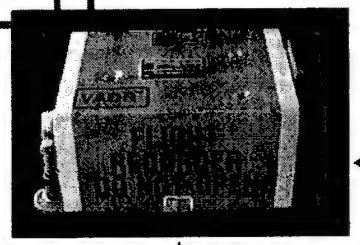
VADR Software Status



VADR Software Design

- Overview
- Loader Program (LP)
- Control Program (CP) and Mux Program (MP) core concept
- Control Program and Mux Program design

Overview



CP MP LP

ASCDB

RS-422 Bus

VOGP

CDF

PC DECOMP

DDF

WinDRT

VOI

WinVOICE

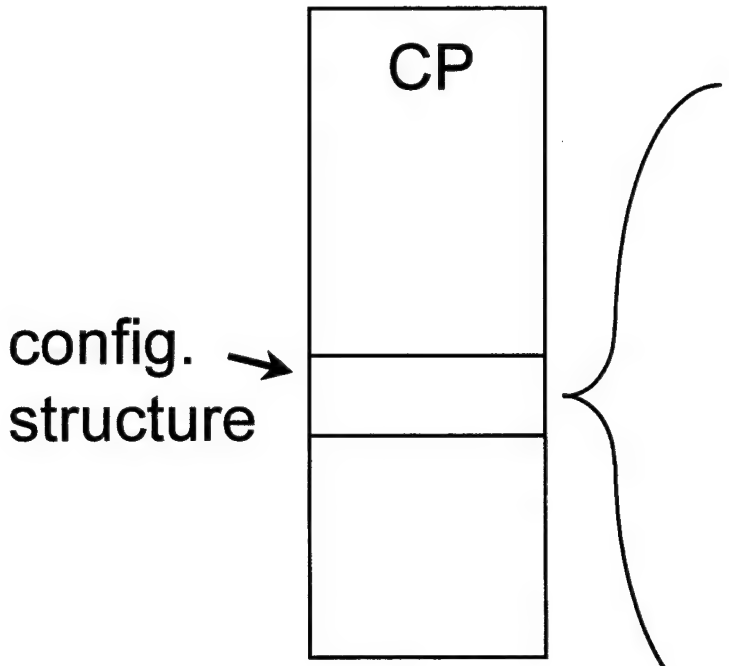
Loader Program (LP)

- Allows uploading a CP
- Transfers control to CP
- Plan to use Current released version of LP (Same version as being used on the C2, C130, VP-3, UP-3 and VH-3 / 60 applications).

Core Software Concept

- All VADR software functionality contained in core image.
- Core software designed to meet application common requirements.
- Application specific requirements met by filling configuration data structure with application specific values.
- Separate part numbers for Core and Application Software

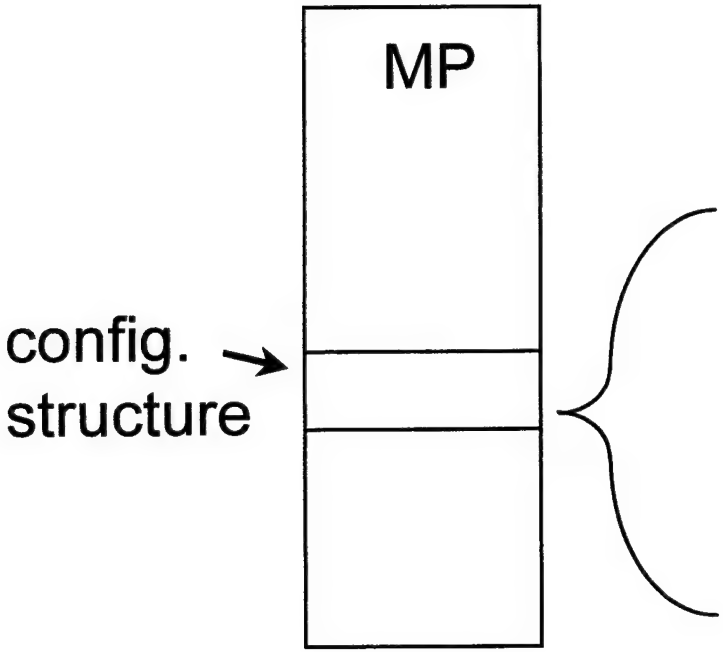
Control Program (CP) Core Concept



Configurable Items:

- Crash Protected Memory (CPM) Size
- CPM Partition Specifications
- Frequency Input Sample Rate
- Audio Channels
- 1553 Card Installed
- VADR RS-422 Address
- Configured CP Part Number
- Record Inhibit Parameters

Multiplex Program (MP) Core Concept

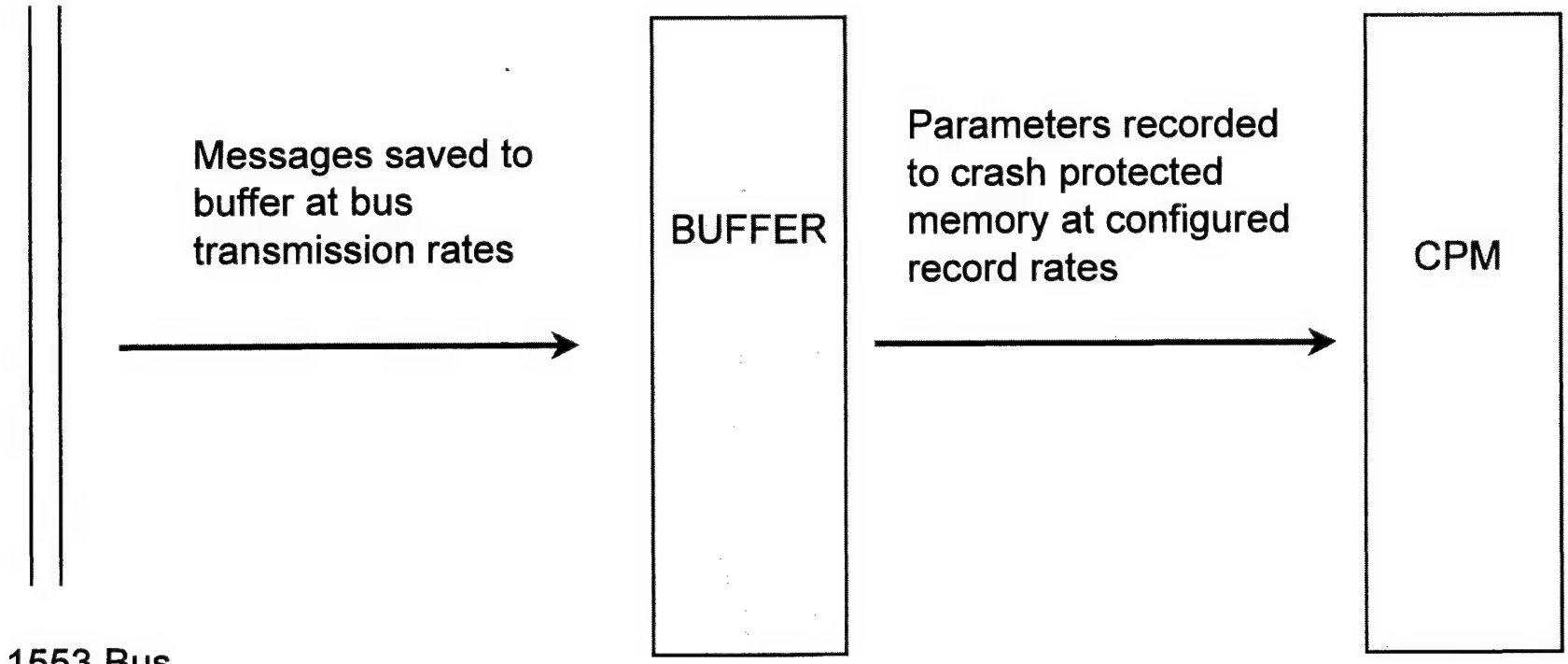


Configurable Items:

- RTA Address if applicable
- Mux bus messages to monitor
- Parameter definitions
- Recording Rates
- Record Start / Stop

Data Recording Scheme

- Two processes: Acquire Data, Record Data



VADR Software Status

Pre-production software coded, tested and delivered

ICD / ICN Status

- Interface Control Document (MDC 98H0002) approved
- Interface Change Notice (ICN) submitted to Boeing for
  - wiring change
  - software part numbers
  - currently in review / signature cycle
- BIT Ambiguity Identification

ICD / SRS Review

- Software Requirement Specification
  - » Preliminary Submittal Approved
  - » All comments resolved
  - » Comments to be included in final submission
  - » Final submission to coincide with final Navy Software approval.
- Navy Request to Identify BIT Ambiguity
  - » Clarify aircraft interface and applicable signal test criteria

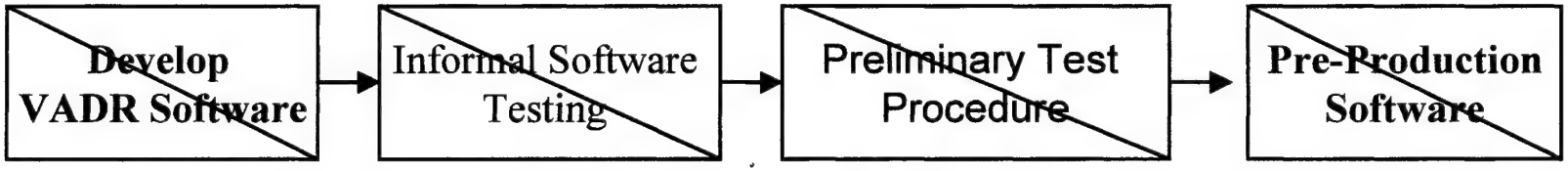
Test Support Equipment

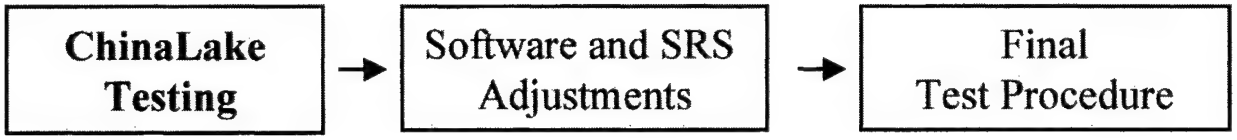
- Dan Rogers (DuoTech)

Software Laboratory Demonstration

Systems Software Test Status

Test Approach





System / Software Test Status

- Informal testing and test procedure development
- Test with captured 1553 bus traffic from AV-8B simulator.
- Pre-Production release test with Preliminary Test Procedure
- Revising Test Procedure as a result of Pre-Production testing.

Planned Activities For Next Two Months

- Support China Lake testing
- Incorporate software updates as required
- Submit test procedure

Action Items (old)

#	Problem Description	Originator	Date Due	Assigned to	Date Completed	Comments
1	Provide final EMI test report to Walt Zavich (Boeing). Once reviewed by Boeing coordinate with PMA-209, platform, and Tom for resolution.	J. Caudill	11-30-98	PMA-209		
2	Coordinate with China Lake and Lakehurst on MDPS for upload/download into SEMP. Includes an asset (UYQ-76A) and ruggedized PC for voice capability to be used for lab testing at China Lake. SEMP coordinate with platforms.	B. Parillo	12-4-98	PMA-209		
3	Provide schematic of T-Cable necessary to support data upload/download for F/A-18CSFIR application using AN/UYQ-76A Computer. Provide schematic designs for both aircraft and bench upload/download operations.					Moved to F/A-18 action item, #7
4	Since production has been halted, need revisions to the following: 1) ECP req ltr change (R. Cohen Ltr 11-12-98) 2) Revise TDL 3) Need new schedule (VAL/VER)	W. Zavich	11-17-98	G. Brewer/ Hines		
5	Get resolution of audio shield signal grounding.	W. Zavich	1-31-99	PMA-209		Boeing EMI Group has concern that proposed shield grounding may introduce noise back into the A/C audio system.
6	Smiths Industries initiate an ICD change to provide new S/W Part Number.	W. Zavich	1-31-99	SI	2/1/99	
7	Provide electronic copy of AV-8B SRS to Boeing, PMA-209, NAWC, and Safety Center simultaneously with delivery of hard copy CDRL submittal to PMA-209.	G. Brewer	11-24-98	SI	11/24/98	
8	Provide lab integration testing schedule based on Smiths Industries S/W delivery.	G. Brewer	1-7-99	G. Brewer		

Issues / concerns / New Action Items

- Integration Schedule / SI support